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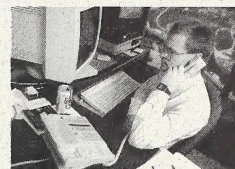
**required**

Science,

Technology

& Society

Series









**NO**

**LAB**

**COATS**

**required**

**Science,**

**Technology**

**& Society**

**Series**



**ACCESS  
NETWORK**

The guide that accompanies **No Lab Coats Required** of the Science, Technology and Society series was written by Helen Brisbin.

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# The Science, Technology and Society Series

STS is an international science education movement. It represents the first significant change in the science curriculum in 25 years. The STS concept strives to broaden the scope of science education by integrating into science curricula accurate presentations of the nature of science, the nature of technology and the interactions of science and technology with each other and society. This video series provides illustrative examples of the relationships between science, technology and society.

The STS connections describe products and processes; environmental and ethical issues relating to the interrelationships among science, technology and society; how scientific knowledge develops and the influence of society on scientific and technological research; and science and technology related careers. The contexts are meant to be relevant to students' lives and also prepare students for life in a rapidly changing society in which science and technology play an important role.

## To the Teacher

Science and technology are shaping our world, and Canada depends on the skills of highly trained specialists in every branch of science. This video should encourage students to consider pursuing science-related careers. The video points out how important science is in our everyday lives, and also features profiles of individuals who use science in their daily occupations. Viewers will see that science does not exist as a separate entity, locked away in a laboratory. Nor is science the exclusive domain of people who wear lab coats. Science is part of our world, and if we don't work directly in science, we certainly depend on it. A good solid background in science is invaluable in today's technological society.

Statistics show that while overall university enrollment increased during the last decade, enrollment in the natural sciences, engineering, and computer courses dropped between 20 and 38 per cent, depending on the course. (*Selling Science to Students*, p. 44) Young people represent our future. If Canada is to maintain its standard of prosperity, and its position as a developed nation, we have to ensure that more of our students are excited and challenged by science.

The video is intended for use at the senior high level, and will also be of interest to junior high students.

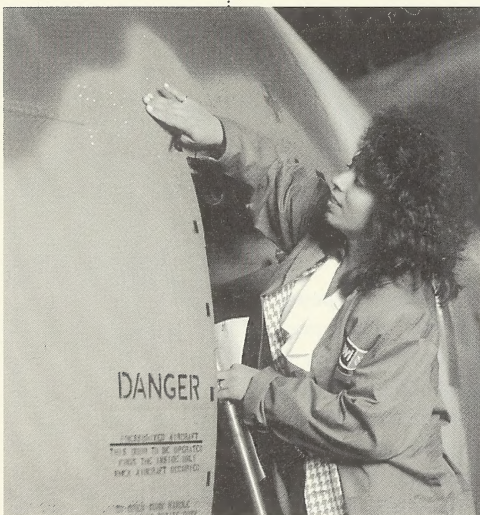


# Overview of No Lab Coats Required

An on-camera host shows viewers that science is an integral part of our daily lives. She introduces several individuals whose occupations involve the application of science or familiarity with scientific principles. These brief profiles take us from a mechanical engineer working on aircraft maintenance to a salesperson who needs a knowledge of science in order to sell a product.

## Profile of an Aircraft Structural Engineer

**Sunitha Zacharia** works as a structural engineer for CAE Aviation, a company involved in the maintenance and overhaul of aircraft. Canada's Department of National Defence is one of CAE's major customers, and Sunitha has worked on a variety of military aircraft, from Hercules transport planes to fighter jets.



Like any other piece of equipment, aircraft are subject to wear and tear and will break down without proper maintenance. The common problems affecting aircraft are corrosion, metal fatigue, and structural cracking. Some repairs to aircraft are routine and can be performed by technicians who follow the appropriate manual. But when damage exceeds what is covered in the manual, the repairs become an engineering decision.

Sunitha Zacharia is called upon when damage to the aircraft exceeds what is routinely covered in the aircraft manual. She assesses the damage, discusses the problem with technicians who do the repairs, and comes up with a plan for repairing the aircraft. She enjoys her work because it offers her the opportunity to be creative and innovative in her designs for repairing the planes.

Carrying out the initial assessment, designing a way to repair the damage and overseeing the repairs are all part of Sunitha's responsibilities. The whole process calls not only for engineering skills and creativity, but also for excellent communications skills. Sunitha is part of a team and depends on the advice and cooperation of those who actually perform the repair work.

Sunitha studied mechanical engineering at university, and learned about aircraft repairs through her work at CAE Aviation. Mechanical Engineering is a very broad field; graduates have to decide where their interests lie, and choose a career which they will find personally rewarding. Sunitha Zacharia chose aircraft maintenance because she has always been fascinated with planes and flying. She finds her work challenging and fulfilling, and is enthusiastic about the opportunities available to students who choose to study engineering. She particularly encourages girls to consider engineering as a career option.



# Profile of a Biomechanical Engineer

**Kelly James** is an engineer in the field of biomechanics. He is working on a new prosthesis which will help users to climb stairs more easily, and will make their gait more natural. The process involves extensive research into force and motion, using computer technology and videotapes to precisely calculate movement and pressure.

Although much of Kelly's research takes place in the lab, he also works with the people who will use these prosthetic devices. Kelly's engineering background enables him to make a direct contribution to individuals – improving the quality of life for people who need artificial limbs.



## Related Careers

People who enjoy science and mathematics should consider engineering as a career. Engineers are involved in projects ranging from the design of equipment to the construction of bridges. They are problem solvers, always looking for a better way of doing things. Right now, the most sought-after engineering graduates are from these disciplines:

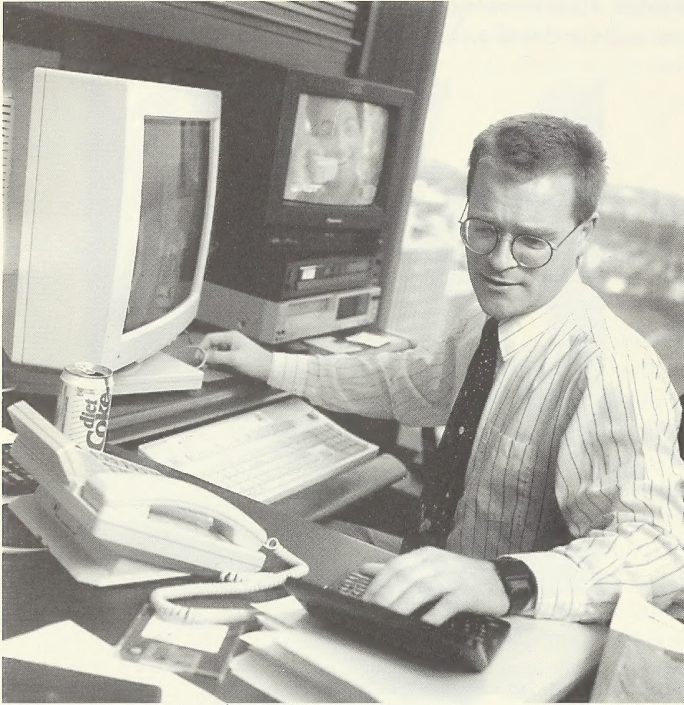
- structural
- geotechnical
- geological
- environmental
- acoustical
- naval
- forensic
- robotics
- electronics
- computer
- aerospace
- aeronautical
- biomedical
- biomechanical
- petroleum

Engineering can be a four year university program, or a five year university co-op program which combines studies with practical experience. In order to become a qualified Professional Engineer, it is necessary to meet the standards set by the provincial association. The candidate must pass examinations set by the association, and complete a two-year Member-In Training program.

A professional engineer's salary compares favourably with that of other professionals, and opportunities for employment are relatively good.

Engineering technology programs are available at technical schools. Different courses pertain to specialized kinds of engineering. The responsibilities and remuneration are not as great as they are for professional engineers, but the course of studies is shorter. Engineering technologists usually have good opportunities for employment in their area of expertise.

## Profile of a Communications Consultant



**Marvin Polis** is an internal communications consultant for a telecommunications company. Although he does not have a degree in science, he works with science every day. Communications today is closely linked with the most advanced computer technology, and the science of communications is constantly evolving.

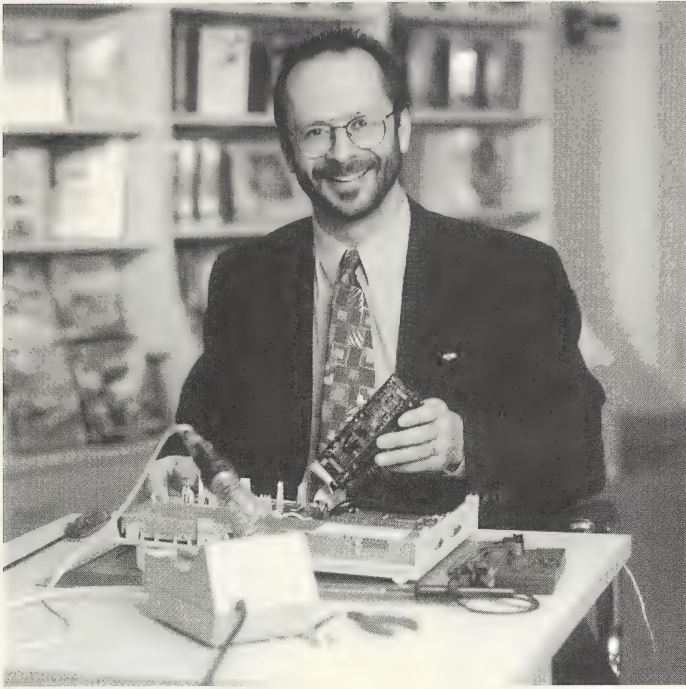
In the field of telecommunications, lifelong learning is part of the job. Marvin Polis credits high school math and science courses with teaching him the skill he needs most in his job – the ability to think.

### Related Careers

Telecommunications is an offshoot of the computer industry, and a university degree can lead to a career in this area. A Bachelor of Science degree in computing science may provide an entry into systems design or data analysis. A degree in mathematics or statistics can also lead to a career in the communications industry.

Technical schools offer more pathways into communications and telecommunications. There are courses in Computer Engineering Technology, Computer Systems Technology, and Telecommunication Engineering Technology. Students who are more attracted to the creative side of communications may be interested in a course in Radio and Television Arts.





## Profile of a Sales Representative

**Ray Lirette** works as a sales representative for a computer company. This is a business where, as Ray puts it, “accelerated change is the status quo”. In order to sell highly technical electronic equipment, a sales representative has to have a thorough understanding of the technology, and its capabilities. After all, the sales person has to be at least as well-informed as the buying public, and today’s “average” customer is extremely sophisticated and knowledgeable.

Ray Lirette describes his work as being involved in a process of continuous learning and continuous upgrading.

Computer technology isn’t the only field where rapid change is the norm. Sales representatives in most other businesses also face constant change – in the products they sell, and in the way they conduct business. No matter what the product, most salespeople are selling a form of science and technology. Whether it is computers, electronic equipment, compact disc players, home entertainment centres, cars, medical equipment, pharmaceuticals, appliances, even processed foods – the advantage of one product over another usually comes down to science. Because we live in a technological society, a solid grounding in science is extremely helpful in the workplace and in daily life.

Sales representatives have to be able to talk science. But then so do consumers. If we want to be informed participants in our society, able to discuss issues intelligently, we need a knowledge of science. Mathematics and science can teach us to think – and help us to understand the world in which we live.

## Profile of Two Entrepreneurs

**Lois and Ted Hole** own and operate a thriving greenhouse business. Ted's university degree in agriculture, combined with Lois' energy and entrepreneurial skills, have produced a winning combination. Although people don't always think of gardening as a scientific activity, horticulture is an extremely complex science.

Horticulture refers to small scale gardening, while agronomy refers to field crops. Both are part of a science that is leading the way in the applications of biotechnology and genetic engineering.

For Lois and Ted Hole, science is a way of life. They continue to improve their own varieties of plants and seeds through the scientific method of experimentation.



## Related Careers

The science of growing plants is a huge business in Canada, and there are opportunities here for people who want to put their scientific knowledge to practical use. A university degree in agriculture can lead to many careers besides farming. There are positions with government and private industry at test farms and research centres. The transportation, processing, and marketing of food products are also part of this industry. The business of agriculture is becoming increasingly sophisticated, relying on complex equipment and biotechnology.

Technical colleges may offer courses in Landscape Architectural Technology and Horticulture, as well as various agricultural courses. A course in Forest Technology is another possibility for students interested in biology, biotechnology, and renewable resources.



# Suggested Activities

Have students research different careers and each complete a profile of one of the people featured in this video, or of an individual they know who is working in a science-related field. The careers seen in the video are:

- mechanical engineer working on aircraft structure
- biomechanical engineer
- corporate internal communications consultant
- computer sales representative
- greenhouse owner/operator

Information to be gathered could include the following:

- number of years of post-secondary education
- courses of study (e.g., general science degree first, followed by specialization)
- qualifying examinations required (e.g., to become a Professional Engineer)
- demand for graduates in this field
- average starting salary
- average salary after ten years
- job security
- opportunities for advancement
- ratio of males to females
- quality of work environment
- level of job satisfaction
- type of individual who may be attracted to this work

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